

REMARKS

Applicants thank the Examiner of the thorough Examination of the application. Now new matter is believed to be added to the application by this Amendment.

Status Of The Claims

Claims 1-20 are pending in the application. Claims 7-12 have been withdrawn from consideration by the Examiner. The amendments to claims 1 and 5 find support at page 16, lines 4-7 of the specification. The amendments to claim 6 find support at page 7, lines 2-5 and at page 14, lines 14-19 of the specification. Claim 13 finds support at page 9, lines 16-23 of the specification. Claims 14-17 find support at page 5, lines 17-22 of the specification. Claim 18 finds support at page 5, lines 24-25 and at page 6, line 21 of the specification. Claim 19 finds support at page 5, line 25 of the specification. Claims 20 finds support at page 6, lines 3-4 of the specification.

Rejections Based On Qiu

Claims 1-3 are rejected under 35 U.S.C. §102(b) as being anticipated by Qiu (U.S. Patent 6,419,849). The Examiner adds the teachings of Lee (U.S. Patent 5,763,092) to the aforesaid rejection to reject claim 4 for obviousness under 35 U.S.C. §103(a). The Examiner adds the teachings of Ohmori (U.S. 2002/0150531) to Qiu (as applied to claim 1) to reject claims 5-6 for obviousness under 35 U.S.C. §103(a). Applicants traverse.

The Present Invention And Its Advantages

The present invention pertains to a method for applying a thin film of metal oxide containing one metal element on a substrate. This one metal can be hafnium, zirconium, praseodymium, aluminum or lanthanum (claim 5).

Figure 2 of the present application depicts an apparatus for carrying out the process of the present invention, and this apparatus includes a container 4 that contains a lidded beaker 12. Placing deionized water 20 in the container 4 in a space outside of the beaker 12 permits a low temperature (claim 2) hydrothermal treatment at 15 atm (claim 6).

The present invention has many embodiments, and a typical embodiment can be found in claim 1:

1. A method for preparing a thin film of metal oxide containing one metal element on a substrate, comprising the steps of:
 - applying a sol-gel solution containing said one metal element to a surface of said substrate;
 - drying said sol-gel solution to prepare a dried gel film on said substrate;
 - soaking said dried gel film on said substrate in an alkaline aqueous solution containing said metal element in a container;
 - sealing said container; and
 - performing hydrothermal treatment for said dried gel film on said substrate in the sealed container to prepare said thin film of metal oxide on said substrate.

Distinctions Of The Invention Over The Cited Art

Qiu pertains to a method of manufacturing a piezoelectric material using a substitution method. Figure 7 of Qiu shows an ABO_3 structure where element a is substituted by a different element a'. Also the ABO_3 of Qiu has A

being a divalent metal element (such as Pb) and B being a tetravalent metal element (such as Ti or Zr), as is discussed at column 6, lines 30-31.

Qiu utterly fails to disclose or suggest a method for preparing a thin film containing one metal element, such as is set forth in claim 1 of the present invention. Qiu additionally fails to disclose or suggest the autoclaving process of the present invention.

In contrast, the present invention prepares a thin film that contains one metal element (claim 1) that can be hafnium, zirconium, praseodymium, aluminum or lanthanum (claim 5). The present invention also uses a container 4 containing a lidded beaker 12 so that deionized water 20 can be present such that autoclaving produces a pressure of 15 atm.

In comparison, Qiu produces a multi-metal ABO_3 material using the process apparatus shown in Fig. 3B, which shows an open water tank 7 that is filled with a metal solution for autoclaving (column 10). That is, there is no teaching or suggestion in Qiu of a container 4 containing a lidded beaker 12 such that deionized water 20 can be present such that autoclaving produces a pressure of 15 atm.

As a result, Qiu clearly fails to anticipate or suggest the present invention.

In paragraph 7 of the Office Action, the Examiner unequivocally admits that Qiu fails to teach boiling the alkaline aqueous solution before soaking. The Examiner turns to Lee for these teachings to reject claim 4.

However, Lee fails to address the inability of Qiu to disclose or suggest the present invention, as has been discussed above. One having ordinary skill in the art would thus not be motivated by the teachings of Qiu and Lee to produce a claimed embodiment of the present invention. A *prima facie* case of obviousness has thus not been made over Qiu and Lee.

In paragraph 8 of the Office Action, the Examiner unequivocally admits that Qiu fails to teach a barium precursor that is barium acetate. The Examiner turns to Ohmori for these teachings to reject claims 5 and 6.

However, Ohmori fails to address the inability of Qiu to disclose or suggest the present invention, as has been discussed above. Also, claim 5 of the present invention now sets forth that the single metal can be one of hafnium, zirconium, praseodymium, aluminum or lanthanum. One having ordinary skill in the art would thus not be motivated by the teachings of Qiu and Ohmori to produce a claimed embodiment of the present invention. A *prima facie* case of obviousness has thus not been made over Qiu and Ohmori.

Accordingly, the present invention is neither anticipated by Qiu nor *prima facie* obvious over Qiu and Lee of Qiu and Ohmori.

These rejections are overcome and withdrawal thereof is respectfully requested.

Information Disclosure Statement

The Examiner is thanked for considering the Information Disclosure Statement filed September 22, 2003 and for making the initialed PTO-1449 form of record in the application in the Office Action mailed June 7, 2005.

The Drawings

The Examiner has indicated that the drawing figures are acceptable in the Office Action mailed June 7, 2005.

Foreign Priority

The Examiner has acknowledged foreign priority and indicated that the certified copy of the priority document has been received in the Office Action mailed June 7, 2005.

Assignment

The Assignment was recorded on September 22, 2003 at reel 014530, frames 0495-0497.

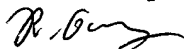
Conclusion

The Examiner's rejections have been overcome. No issues remain. The Examiner is accordingly respectfully requested to place the application in condition for allowance and to issue a Notice of Allowability.

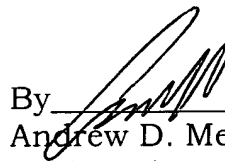
Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Robert E. Goozner, Ph.D. (Reg. No.42,593) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

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Respectfully submitted,



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